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Lactic Acid Will Be Sorely Missed

By JOHN HANC

WHILE joggers, weightlifters, recreational softball players and other fitness enthusiasts will surely be delighted to hear that exercise science now sees lactic acid as a force of good and not evil, the fact remains that people are sore. What can be done about it?

While lactic acid can cause a burning sensation during hard exercise (because it is, as the name suggests, acidic) recent research has confirmed that the real culprits for the so-called delayed muscle soreness that comes one to three days after a big game or heavy workout are microscopic tears and trauma to the muscles and inflammation.

By the time delayed muscle soreness happens, "The lactic acid is pretty much back to normal levels," said Allan H. Goldfarb, a professor in the department of exercise and sport science at the University of North Carolina at Greensboro.

Lactic acid, which is produced by the breakdown of glucose in the body, was once seen as little more than a waste product. That view has changed, and lactic acid is now seen as an important fuel source for the body. "We're finding now that lactic acid is a major player in metabolism," said Thomas Fahey, an exercise physiologist at [California State University](#), Chico.

The working muscles of the body, the heart, the diaphragm, even the brain, all "thrive" — as Dr. Fahey described it — on lactic acid as an important energy source. It may even help stimulate weight loss, he added.

The thinking about how to deal with the soreness has changed as well. In "The Complete Book of Running," published in 1977, the author and marathoner Jim Fixx said that soreness was "pretty much unavoidable," and recommended **"a hot bath followed by a massage with some liniment."** In the book, a best seller generally credited with helping to spark the running boom, the author, who died in 1984, went on to write that, "once you have sore muscles, there isn't much you can do about them except take a sauna and wait for the pain to go away."

Wait? In today's impatient culture, athletes and trainers take a more active approach to soreness. National Football League players, for example, may be some of the sorest athletes in the world. Every Sunday during their season, their muscles, to use the exercise physiologists term, suffer "insult" to a degree most of us could not withstand. "It takes these guys sometimes until Wednesday or Thursday to feel human again," said Todd Durkin, a licensed massage therapist and strength and conditioning coach in San Diego, who works with many N.F.L. players. "Recovery is a real important part of their training regimen."

Repairing these well-paid muscles is a high priority for both the team and their trainers. Typically, it starts with a postgame "ice plunge," five minutes immersed in a tub filled with ice. "The cold is one of the best things you can do to reduce inflammation," Mr. Durkin said. "Cold constricts the cells, basically closing them down, and gets rid of any toxicity or inflammation through trauma."

One of Mr. Durkin's clients is LaDarian Tomlinson, the [San Diego Chargers'](#) star running back, who gets tackled about 30 times a game. On Mondays during the season, Mr. Tomlinson spends much of the day

with Mr. Durkin trying to minimize soreness, reduce inflammation and speed what Mr. Durkin calls "the regeneration process." To do so, more ice will be applied, and Mr. Tomlinson gets **60 minutes of deep massage and body work**. But he also does light exercises — walking on a treadmill and weight-training movements — which may sound counterintuitive, but are basic to most treatments of sore bodies.

Although research has been unable to prove its value, "keep it moving" is a principle long prescribed by trainers and therapists. "The day after a race, you bike or swim or walk, something to just loosen yourself up," said David Balsley, a physical therapist in Manhattan who is also a competitive runner and triathlete. In the past, the reason for moving was often described as being to work the lactic acid out of muscles and reduce soreness. We know better now. Lactic acid isn't the problem, but soreness still is. Can the microtrauma and inflammation that are fingered as its causes be prevented? To some extent, the experts say yes.

"First off, try not to get damaged," Dr. Goldfarb said. "When you increase your workload, you should be doing it gradually." The rule of thumb is no more than 10 to 15 percent increases a week. For example, if you walk three miles this week, you should be doing no more than about three and a half next week.

Still, said Jeffrey A. Potteiger, a professor of exercise science at Miami University in Ohio, Mr. Fixx might have been partly correct when he wrote of the inevitability of mild soreness. "If you run a marathon, you're going to get sore, and there's not a whole lot you can do about it," Dr. Potteiger said. "If you do almost anything you're not accustomed to doing, you'll get some soreness. The good news is that if you continue to do that activity, the soreness will not be as prevalent and in some instances will go away. The body will adapt to that workload."

In the meantime, ice, stretch and perform light activity to help work the soreness from your muscles. Just be clear that it's not lactic acid you are working out. That soreness, Dr. Thomas Fahey of Chico said, "is completely due to muscle injury and inflammation."

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